Food and Agriculture Organization of the United Nations

# Forest and farm producers – climate-change sentinels

Policy brief

*Small-scale producers are bolstering their resilience on the frontline of climate risk, with vital assistance from their representative organizations. Channelling more help to smallholders through such organizations will yield globally important benefits.*

©FAO/IssifouAboudoumisamilou

SHOUT
SHARE
IT

Required citation:

**Simola, N., Vuori, K., Macqueen, D. & Sarre, A.** 2021. *Forest and farm producers – Climate-change sentinels: Policy brief*. Rome, FAO. https://doi.org/10.4060/cb6964en

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

ISBN 978-92-5-135019-5
© FAO, 2021

Some rights reserved. This work is made available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; https://creativecommons.org/licenses/by-nc-sa/3.0/igo/legalcode).

Under the terms of this licence, this work may be copied, redistributed and adapted for non-commercial purposes, provided that the work is appropriately cited. In any use of this work, there should be no suggestion that FAO endorses any specific organization, products or services. The use of the FAO logo is not permitted. If the work is adapted, then it must be licensed under the same or equivalent Creative Commons licence. If a translation of this work is created, it must include the following disclaimer along with the required citation: "This translation was not created by the Food and Agriculture Organization of the United Nations (FAO). FAO is not responsible for the content or accuracy of this translation. The original [Language] edition shall be the authoritative edition."

Disputes arising under the licence that cannot be settled amicably will be resolved by mediation and arbitration as described in Article 8 of the licence except as otherwise provided herein. The applicable mediation rules will be the mediation rules of the World Intellectual Property Organization http://www.wipo.int/amc/en/mediation/rules and any arbitration will be conducted in accordance with the Arbitration Rules of the United Nations Commission on International Trade Law (UNCITRAL).

Third-party materials. Users wishing to reuse material from this work that is attributed to a third party, such as tables, figures or images, are responsible for determining whether permission is needed for that reuse and for obtaining permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

Sales, rights and licensing. FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org. Requests for commercial use should be submitted via: www.fao.org/contact-us/licence-request. Queries regarding rights and licensing should be submitted to: copyright@fao.org.

# Forest and farm producers – Climate-change sentinels

## Policy brief

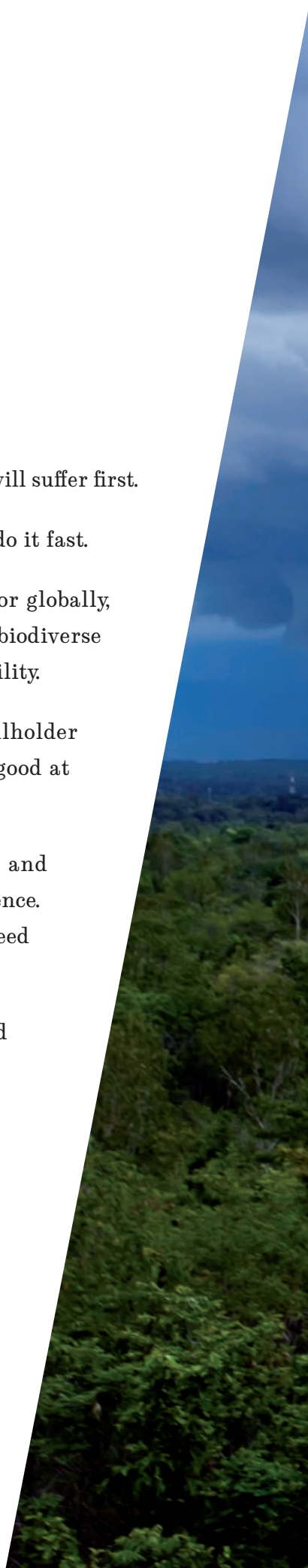
Simola, N., Vuori, K., Macqueen, D. & Sarre, A.

Food and Agriculture Organization of the United Nations

Rome, 2021

# Key points

- The world is increasingly vulnerable to climate catastrophes, and the poor will suffer first.
- To reduce the risk we must build more climate resilience, and we must do it fast.
- Collectively, forest and farm smallholders are the largest private sector globally, supplying at least one-third of the world's food. They live in and manage biodiverse landscapes and are therefore essential partners for achieving sustainability.
- Poverty and direct dependence on natural resources make many smallholder rural producers highly vulnerable to climate hazards – but also very good at plotting ways to be resilient.
- Forest and farm producer organizations bring smallholders together and support them in powerful, diverse ways, including building climate resilience. They are effective, efficient and extraordinarily resourceful – but they need backing.
- An immediate upsurge in climate finance for such organizations would build vital resilience into smallholder livelihoods, landscapes and food systems, with benefits at a planetary scale.
- Support for forest and farm producer organizations would strengthen efforts to build back better from the COVID-19 pandemic.



©freedomnaruk

# Definitions

**Resilience** is the capacity of a system to withstand disturbances, cope with them and bounce back.

**Climate resilience** is the ability to anticipate, prepare for, resist, recover from and reorganize in the face of hazards related to climate change.

**Forest and farm producer organizations** are member-based associations that bring together forest and farm producers – indigenous peoples, communities, and private smallholders – to provide training, financial, marketing, advocacy and other support services.

# Introduction

Scientists increasingly agree that climate change poses a life-threatening risk to human communities. The concentration of atmospheric carbon dioxide now exceeds the level at any time in the last 800 000 years.[1] Annual and seasonal rainfall, temperature, moisture stress and other climatic measures are moving rapidly outside their known historical ranges of variability.[2]

The changing climate is exacerbating other threats, such as those posed by poverty, human diseases, and poorly conceived land-use change.

The likely impacts are dire. For example, climate risks could push 100 million people into extreme poverty by 2030 and 720 million people by 2050.[3] Climate-associated sea-level rise could force hundreds of millions of coast-dwellers from their homes by 2050.[4]

The world is vulnerable to catastrophe on an epic scale. To reduce the risk we must build more resilience into production and social systems, and we must do it fast.

What mechanisms will be most effective? This policy brief draws on reports by Forest and Farm Facility partners AgriCord[5] and the International Institute for Environment and Development (IIED)[6] to urge a focus on smallholder producer organizations. Such organizations represent millions of families who earn their living from smallholder forests and farms. As shown here, they are already helping their members increase resilience and have tremendous potential to do more. The brief ends by advocating the scaling up of assistance to such organizations to provide benefits at a planetary scale.

©FAO/Boris Fernandez

# Why the resilience of small-scale producers – and their representative organizations – matters

Almost 1.3 billion people depend on forests for at least part of their livelihoods.[7] Most are "producers" of some sort – either in meeting subsistence needs or through commercial arrangements. Five hundred million people self-classify as indigenous and a further 800 million people worldwide live in community forestry settings, smallholder forest and farm patchworks, and periurban forest-product-processing centres.[8]

The combined gross value of the food, fuel, timber and non-timber products produced by forest and farm smallholders is estimated at USD 881 billion–1.505 trillion per year;[9] collectively, they are by far the world's largest private-sector player. Despite using less than 25 percent of the world's total input resources, such as land, water and fossil fuels, smallholder forest and farm producers supply an estimated 34–70 per cent of the world's food.[10] In other words, they are more resource-efficient than industrial-scale producers.

Many forest and farm smallholders belong to like-minded groups as a way of sharing information, contacts, equipment and costs and increasing their collective power to negotiate with traders, markets and political decision-makers. Such producer organizations, therefore, are pivotal for determining what happens in forest and farm landscapes globally as the climate crisis deepens.

## *What is the mission of forest and farm producer organizations?*

IIED surveyed 41 forest and farm producer organizations in six countries in 2019.[11] It found that the three most dominant values pursued by these organizations were environmental sustainability, economic wealth and social respect.

Forest and farm producer organizations vary enormously in their membership and scope. It is clear, however, that their visions of prosperity are highly conducive to the conservation, sustainable management and therefore resilience of forest and farm landscapes. There is also good evidence that such organizations innovate in diverse ways to grow the prosperity of their members.[12]

@FAO/FlorenceDorley

# Producer collectives know that resilience is imperative

Forest and farm producer organizations understand the importance of building the resilience of their members in the face of rapid change. The quest has at least four dimensions.

Building **social resilience** is important because, in remote forest landscapes, self-help through organization is often the only way forward.[13] Forest and farm producer organizations enable smallholders – powerless on their own – to speak with a common political voice and to amplify their negotiation power with decision-makers, buyers and suppliers. Perhaps most crucially, they foster a sense of common purpose and solidarity among their members.

Forest and farm producer organizations want to ensure **ecological resilience** because the health of forest and farm ecosystems is fundamental to the livelihoods and resilience of their members.

Forest and farm producer organizations pursue **economic resilience** to ensure that the businesses of their members remain capable of generating income, even in hard times.

Smallholder representative organizations often also invest in **physical and technological** resilience by upgrading infrastructure in remote areas. Terracing, irrigation, roads, electrification, mobile telephony and other physical infrastructure improve access to markets but need to be well managed to avoid causing additional losses of forests and biodiversity. Producer collectives live with the consequences of environmental degradation and so are well placed to navigate trade-offs between the ecological risk posed by infrastructure and its importance for smallholder resilience.

@FAO/PhamThang

# How do producer organizations build resilience?

Forest and farm producer organizations help their members to innovate and implement practical solutions and to design strategies for resilience. They embrace **nature-based solutions**, often grounded in sustainable forestry and agroecological practices, and **inclusive management and service solutions** that promote participatory governance, integrated landscape management and efficiency in service provision through technological advances. By adopting these solutions, forest and farm producer increase the preparedness and adaptive capacity of their members in three key domains, thereby contributing to their resilience strategies:[14]

1. **Increasing the viability of livelihoods** – forest and farm producer organizations help members swell their profits by increasing productivity, adding value and developing better-functioning value chains. This increases resilience by creating new prospects for rural employment, reducing poverty and encouraging young people to engage in forest and farm activities.
2. **Managing crises** – forest and farm producer organizations encourage systematic risk assessments, risk mitigation plans, improved data management, diversification, insurance and the uptake of efficient technologies to increase the capacity of smallholders to manage crises – such as during the COVID-19 pandemic. They also have the capacity to act during emergencies on behalf of their members and to help them recover.
3. **Creating new opportunities from ecological restoration** – forest and farm producer organizations promote ecological resilience and climate-change mitigation by ensuring the sustainable management of forest and farm ecosystems. Practical measures include reforestation, forest restoration, longer tree rotations, sustainable forestry, agroforestry, agroecology and crop diversification.

©FAO/AndryRakotoHarivony

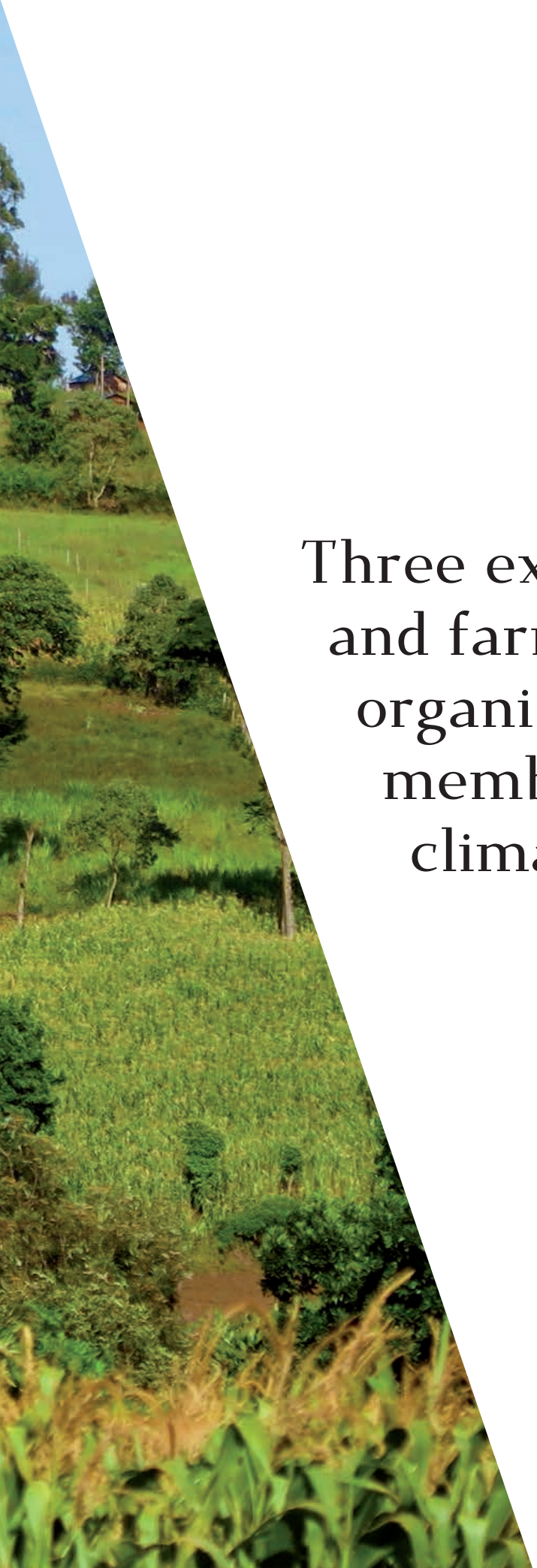
# Producer organizations are delivering climate resilience

Climate resilience is a fundamental aspect of the work of forest and farm producer organizations. Their members feel the destructive force of extreme weather events and must adapt to increasing rainfall variability, which makes planting time a lottery. Moreover, they are frontline observers of what is happening in the environment, so they have important knowledge for averting the threats posed by climate change.

The abovementioned IIED survey found that the top priority of most respondent producer organizations was obtaining new knowledge on, and options for, climate resilience.[15] Other priorities include related aspects such as climate-smart agroforestry, organic approaches to maintaining soil fertility, and coping with pest upsurges.

Forest and farm producer organizations around the world are busily building the preparedness of their members and helping them mitigate the risks associated with climate change. In a global survey conducted by AgriCord and the Forest and Farm Facility in 2020, 85 percent of 111 respondent smallholder producer organizations reported that they were engaged in climate action, such as through strategy development, collaboration with other actors, and providing advisory services on climate-change adaptation and mitigation.[16] A recent Forest and Farm Facility study by IIED identified 30 options for increasing climate resilience, distilled from the current practices of dozens of producer organizations.[17]

©FAO/PhilipKisoyan



# Three examples of forest and farm producer organizations helping members become more climate-resilient[18]

## *Pest management for fall armyworm in Benin*[19]

The Union of Cooperative Farmers Groups Mowossokpo (UGAM) operates in the Savalou-Bantè region in Benin; it has about 3 250 members, including nearly 1 900 women. The fall armyworm, an invasive pest, is spreading as the climate warms. It appeared in the region in 2016, where it now causes significant losses in corn production.

Farmers in Savalou-Bantè were already under stress, and the arrival of the new pest has made the situation worse. Soils in the region are relatively infertile; the land has largely been cleared of its original forest and is degraded; and annual rainfall is declining. In-migration by new farmers and herders has added to pressure on the land and become a source of tension.

UGAM has used its organizational capacity to find a solution to the fall armyworm invasion. Drawing on the success of producers in Quebec, Canada, UGAM created a training programme to educate producers in detecting fall armyworm and putting integrated pest management strategies in place. The latter include measures such as exposing pupae to the sun when preparing soils; shifting the planting period to avoid attack peaks; removing weeds that encourage the worm to spread; and regularly observing fields to detect attacks and enable early interventions.

Farmers are now able to prevent devastating outbreaks of the pest while strengthening their adaptive capacity. UGAM is encouraging farmers to diversify their crops to further reduce the risk of pest outbreaks.

Integrated pest management decreases the use of chemical pesticides because it also deploys biological control and prevention practices. This, in turn, decreases the carbon footprint of production systems, helping mitigate climate change.

The UGAM approach is proving highly cost-effective, but scaling it up to other regions will require financial support so that producer organizations can obtain equipment such as pheromone traps on behalf of their members and provide training.

## *Financial services for vulnerable communities in the Amazon biome in Brazil*[20]

Getting to Codajás involves a six-hour boat trip up the Amazon River from Manaus. The municipality's 1 130 rural producers occupy an area of about 70 000 ha, of which 61 000 ha is native forest and woodland. The most produced commodities are açaí, banana, native caesarweed, cassava and cupuaçu. Environmental pressures in the region, and the impacts of climate change, are bringing insecurity and instability to incomes and choking off longer-term investment.

Economic development in Codajás is also hindered by geographic isolation. To compensate for the lack of financial services, CRESOL, a cooperative credit union founded by smallholder farmers in southern Brazil, initiated a pilot project to expand its services to the Amazon. CRESOL has 293 000 members, 86 percent of whom are family farmers working in various value chains.

In its work teaching farmers in Codajás about accessing credit, CRESOL is demonstrating that a credit cooperative can be far more than a financial service. The organization's trainers provide on-site and e-learning courses for forest and farm producers on, for example, financial education, planning, entrepreneurship, leadership and how to set up cooperatives.

The increased access to credit offered by the project has been pivotal in improving forest management, transportation and marketing and diversifying businesses. The social and economic inclusion of vulnerable groups is central to the project's strategy. Of the total credit provided to businesses in the municipality in 2019–20, 61 percent (USD 115 000) was invested in agricultural activities promoting resilience to climate change.

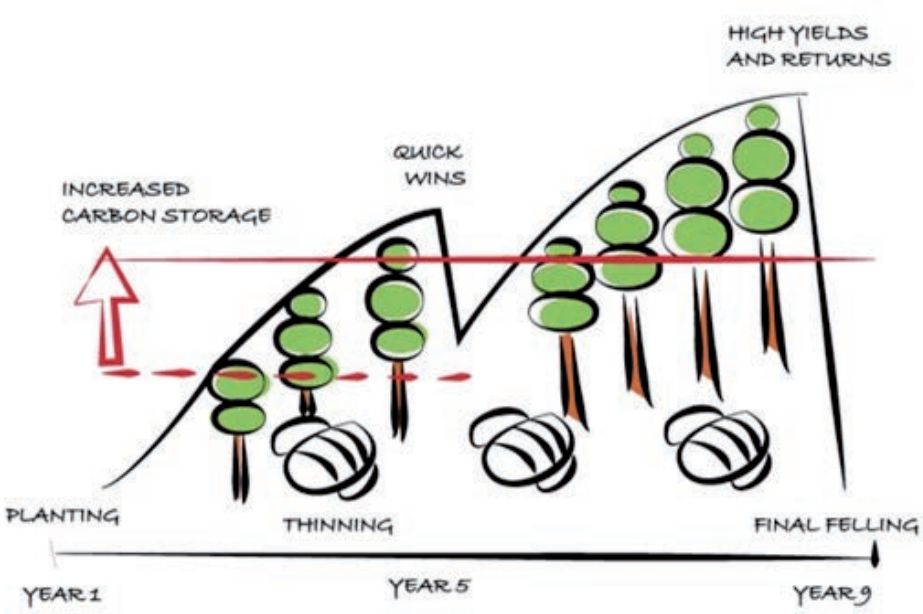
The CRESOL model of financial inclusion has huge potential for scaling up to the provincial, national and international levels. CRESOL already has 250 branches in Brazil, each providing local services.

## *Spatial optimization of herbs, long-rotation timber and beekeeping to boost income security and climate benefits*[21]

Organized smallholder farmers in Viet Nam's coastal central provinces and the northern mountainous region are diversifying their incomes through forestry, made possible in recent decades by government reforestation and land allocation programmes.

Mainstream plantation management lacks long-term forest planning, however, and fails to fully seize the opportunity that forestry presents as a resilience strategy. Smallholders tend to grow trees in 4–5-year rotations, selling their low-quality timber for pulpwood because they need quick cash. In financial terms, however, shifting to longer rotations requires fewer inputs on-site and is more profitable than short-rotation regimes.[22]

To increase smallholder profitability, diversity and resilience, forest and farm producer organizations in Quang Ngai, Yen Bai, Bac Kan and Hoa Binh have piloted approaches involving longer tree rotations combined with honey and herb production.




An improved forest management regime in smallholder acacia plantations, which includes prolonging the rotation time and allowing the trees to grow bigger. While waiting for high yields, smallholders earn income from producing honey and from the small-sized logs extracted during thinning operations. This system also stores more carbon than a five-year rotation for pulpwood.

The approach integrates both quick wins and longer-term commitments in forestry (see figure). Smallholders become part of forest management plans created by local farmer organizations and commit themselves to wood production with a minimum rotation of eight years. Under the plans, most trees grow for several years longer than before.

Poor households need quick wins while waiting for their plantations to mature. Thinning is an integral part of the pilot regimes – it enables farmers to harvest and sell about one-third of their standing timber after 5–6 years while also increasing the quality and growth rates of the remaining trees.

The approach includes beekeeping, which benefits from the abundant flowering of acacias, and the growing of herbs among the trees. Honey production provides additional income for households and also supports pollination services. Planting herbs under the forest canopy offers yet another source of income and helps reduce soil erosion by adding ground cover.

Forest and farm producer organizations can efficiently enable smallholders and poor households to adopt this model and thereby achieve quick financial wins, longer-term value-adding and greater economic and environmental resilience.

©FAO/PhamThang

# Conclusion

Environmental change is occurring at a speed outside the range of past experience. Building the resilience of communities and landscapes is necessary if millions of smallholder farmers are to survive such change and play their crucial role in global food security and in maintaining sustainable forest and farm landscapes.

Forest and farm producer organizations and their federations and networks must be pragmatic and solution-oriented in building the resilience of their members. Organization empowers smallholders to make positive changes in their lives and landscapes with the aim of ensuring viability over generations. Forest and farm producer organizations provide an efficient delivery mechanism for resilience actions at two strategic levels:

1. they reach and influence vast numbers of smallholders; and
2. they routinely adopt and spread all 30 of the main options for increased climate resilience.

Forest and farm producer organizations are already strongly engaged in actions aimed at increasing the climate resilience of their members. But making adaptive change requires resources. Direct investment in such organizations, made now, would deliver a timely boost to the resilience of smallholder livelihoods, landscapes and food systems in the face of otherwise devastating change.

# Recommendations for donors and policymakers[23]

- Acknowledge the local knowledge of forest and farm producers, their collectively massive contributions to the local, national and global food systems, and their legitimate and necessary role in landscape-scale decision-making.
- Build long-term resilience among smallholders by complementing COVID-19 support and other short-term funding with longer-term support for adaptation, mitigation and restoration initiatives that also support livelihoods and reduce poverty.
- Scale up support for forest and farm producer organizations as a means for de-risking and incentivizing smallholder investment in practices that add to climate resilience.
- Strengthen mechanisms that help build the capacity of forest and farm producer organizations to broaden the economic, ecological, social, physical and technological options available to their members in the face of climate change.
- Ensure a just transfer to climate-resilient societies through incentive schemes and investments aimed at forest and farm producers – men, women and youth.
- Ensure accountability for commitments made by governments and other actors to support agriculture, forestry and climate actions through the participation of forest and farm producer organizations in landscape-scale initiatives, incentives, and government policies, programmes and decision-making.

# Endnotes


1. IPCC. 2018. *Global warming of 1.5°C – An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels*. Geneva, Switzerland, Intergovernmental Panel on Climate Change (IPCC).

2. USGCRP. 2017. *Climate science special report – Fourth national climate assessment*. Volume 1. Washington, DC, US Global Change Research Programme (USGCRP).

3. Hallegatte, S., Bangalore, M., Bonzanigo, L., Fay, M., Kane, T., Narloch, U., Rozenberg, J., Treguer, D. & Vogt-Schilb, A. 2015. *Shock waves – Managing the impacts of climate change on poverty*. Washington, DC, World Bank Climate Change and Development Series.

4. Hallegatte, S., Green, C., Nicholls, R.J. & Corfee-Morlot, J. 2013. Future flood losses in major coastal cities. *Nature Climate Change*, 3(9): 802–806.

5. Simola, N. & Vuori, K., eds. 2021. *Forest and farm producer organizations building resilience – Strength in numbers and landscapes*. Rome, FAO.

6. Macqueen, D. 2021. *Diversification for climate resilience – Thirty options for forest and farm producer organizations.* London, International Institute for Environment and Development (IIED).

7. Mayers, J., Buckley, L. & Macqueen, D.J. 2016. *Small, but many, is big – Challenges in assessing the collective scale of locally controlled forest-linked production and investment*. London, International Institute for Environment and Development (IIED). Available at: https://pubs.iied.org/16615IIED

8. Macqueen, D. & Mayers, J. 2020. *Unseen foresters – An assessment of approaches for wider recognition and spread of sustainable forest management by local communities*. Stockholm, WWF-Sweden. Available at: https://pubs.iied.org/G04468

9. Verdone, M. 2018. *The world's largest private sector? Recognising the cumulative economic value of small-scale forest and farm producers*. Gland, Switzerland, International Union for Conservation of Nature (IUCN). Available at: https://portals.iucn.org/library/sites/library/files/documents/2018-025-En.pdf

10. Ricciardi, V., Ramankutty, N., Mehrabi, Z., Jarvis, L. & Chookolingo, B. 2018. How much of the world's food do smallholders produce? *Global Food Security*, 17: 64–72. https://doi.org/10.1016/j.gfs.2018.05.002; ETC Group. 2017. *Who will feed us? The industrial food chain vs. the peasant food web.* Third edition. Available at: https://tinyurl.com/y6boahxh

11. Covey, J., Macqueen, D., Bolin, A. & Hou-Jones, X. In press. *Co-producing knowledge – A demand-led, prosperity-focused, research agenda with forest and farm producer organisations*. Environmental Science and Policy.

12. Macqueen, D., Bolin, A., Greijmans, M., Grouwels, S. & Humphries, S. 2020. Innovations towards prosperity emerging in locally controlled forest business models and prospects for scaling up. *World Development*, 125: 104382. https://doi.org/10.1016/j.worlddev.2018.08.004

13. Pretty, J., Attwood, S., Bawden, R., Van den Berg, H., Bharucha, Z., Dixon, J., *et al*. 2020. Assessment of the growth in social groups for sustainable agriculture and land management. *Global Sustainability*, 3: E23. http://doi:10.1017/sus.2020.19

14. Simola, N. & Vuori, K., eds. 2021. *Forest and farm producer organizations building resilience – Strength in numbers and landscapes*. Rome, FAO.

15. Covey, J., Macqueen, D., Bolin, A. & Hou-Jones, X. In press. *Co-producing knowledge – A demand-led, prosperity-focused, research agenda with forest and farm producer organisations*. Environmental Science and Policy.

16. Simola, N. & Vuori, K., eds. 2021. *Forest and farm producer organizations building resilience – Strength in numbers and landscapes*. Rome, FAO.

17. Macqueen, D. 2021. *Diversification for climate resilience – Thirty options for forest and farm producer organizations.* London, International Institute for Environment and Development. [Link to infographic]

18. See Simola, N. & Vuori, K., eds. 2021. *Forest and farm producer organizations building resilience – Strength in numbers and landscapes*. Rome, FAO.

19. This summary is adapted from a case study prepared by Ernest Doukpon, Cassandre Hervieux Gaudreau and Atte Penttilä.

20. This summary is adapted from a case study prepared by Felipe Jhonatan Alessio, José Carlos Vandresen, Gisele Obara, Stefaan Bonte and Atte Penttilä.

21. This summary is adapted from a case study prepared Noora Simola, Pham Tai Thang and Vu Le Y Voan.

22. Arvonen, A., Ha, H., Kanninen, M., Malkamäki, A. & Simola, N. 2021. Financial attractiveness of wood production in smallholder plantations of central Vietnam in the context of developing carbon markets. *Journal of Tropical Forest Science,* 33(2): 137–148. https://doi.org/10.26525/jtfs2021.33.2.137

23. These recommendations are drawn from the findings of the AgriCord and IIED studies on which this policy brief is based (Simola and Vuori, 2021; Macqueen, 2021), as well as on the results of the global web-based conference and consultation, Multidimensional Resilience – Smallholder Producers Managing Risks, held in June 2020 and organized by Food and Forest Development Finland, AgriCord and the Forest and Farm Facility in collaboration with the Asian Farmers' Association for Sustainable Rural Development and the Pan-African Farmers' Organization.

For more information, please contact:
Forestry Division – Natural Resources and Sustainable Production
E-mail: forest-farm-facility@fao.org
Web address: http://www.fao.org/forest-farm-facility/en/

**Food and Agriculture Organization of the United Nations**
Rome, Italy

CB6964EN/1/10.21